

ENVIRONMENTAL PROTECTION AGENCY

[A-2001-05]

Notice of Availability for Public Comments ---Infineum Corporation's VEKTRON® 6913 Gasoline Fuel Additive Test Program

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of Availability for Public Comment.

SUMMARY: Today EPA is requesting comment on the results of a gasoline additive emissions test program submitted to EPA for technical review by Infineum Corporation. Infineum conducted a test program to determine the effect of the gasoline fuel additive VEKTRON® 6913 in reducing tailpipe oxides of nitrogen (NO_x) emissions from on highway motor vehicles. This notice solicits specific comments on Infineum's test program, emission test results, and statistical analysis of the NO_x emission impacts. Infineum conducted a series of tests on a sample population of current automobiles and light duty trucks that use gasoline that contains the VEKTRON® 6913 additive compared to vehicles operating without this specific additive. EPA invites comment to inform its decision-making concerning the evaluation of the emissions reduction testing program and the resulting conclusions made by Infineum associated with use of this additive.

DATES: The EPA is establishing a 45-day comment period, ending **April 30, 2001**

ADDRESSES: Comments should be submitted (in duplicate, if possible) to: Air and Radiation Docket and Information Center (6101), Attention: Docket No. A-2001-05, U.S. Environmental Protection Agency, 401 M Street SW, Room M-1500, Washington, DC 20460, telephone (202) 260-7548, between 8 a.m. and 5:30 p.m., Monday through Friday, excluding legal holidays. A reasonable fee may be charged for copying. Comments and data may also be submitted electronically by following the instructions under SUPPLEMENTARY INFORMATION of this document. Any confidential business information (CBI) should be submitted through e-mail.

FOR FURTHER INFORMATION CONTACT: For specific questions and comments on this guidance, contact Mr. Michael Ball, U.S. EPA, OAR/OTAQ/TRPD/TMIG, 2000 Traverwood, Ann Arbor, MI 48105, telephone (734) 214-4897 ["ball.michael@epa.gov"](mailto:ball.michael@epa.gov)

SUPPLEMENTARY INFORMATION:

Electronic Availability—A World Wide Web (WWW) site has been developed so that you can obtain a copy of this announcement and supporting information for review and comment. The Uniform Resource Location (URL) for the home page of the web site is <http://www.epa.gov/ttn/oarpg>. You can find the protocol and supporting information under the heading titled "What's New." If you need additional assistance with these web sites, call the TTN Helpline at (919)541-5384. If you lack access to the World Wide Web, you may request a

copy of the protocol and supporting information from the individual listed above under FOR FURTHER INFORMATION CONTACT.

The EPA has established a docket for materials relevant to this notice (which will include the test program and supporting information, plus any public comments) under EPA air docket number A-2001-05. A public version of this record, including printed, paper versions of electronic comments—but excluding any information claimed as confidential business information (CBI)—is available for inspection from 8 a.m. to 5:30 p.m., Monday through Friday, excluding legal holidays. The official record is located at the address in ADDRESSES at the beginning of this document. Electronic comments can be sent directly to EPA at: A-and-R-Docket@epa.gov. Electronic comments must be submitted as an ASCII file avoiding the use of special characters and data will also accepted on disks in WorkPerfect in 5.1 file format or ASCII file format. Electronic comments on this proposed rule may be filed online at many Federal Depository Libraries.

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I. Overview

Infineum USA L.P. manufactures a variety of gasoline and diesel fuel additives. In 1996, Infineum (then Shell Chemical) approached EPA regarding whether the Agency would accept the use of its Vektron® 3000 series gasoline additive as an air quality control measure in a State's Implementation Plan (SIP) for purposes of emissions credit generation and trading. Based on a

new fleet test program, Infineum has prepared and submitted to the EPA a statistical analysis on the use of Vektron® 6913, a close relative of the 3000 series, which contains a conventional detergent plus a NOx reduction component called Vektron® 1200. Infineum's analysis indicates a statistically significant reduction in oxides of nitrogen(NOx) emissions (estimated at 10 percent) from automobiles and light-duty trucks with no adverse impacts on emissions of hydrocarbons (HC) or carbon monoxide (CO), or on fuel economy. Infineum would like to promote the Vektron® 6913 additive as a method to generate emissions reductions (i.e., tradeable credits) which in turn could be resold to stationary sources in need of supplemental emissions reductions. Infineum has stated that it is not seeking a national mandate for its gasoline additive in reducing NOx emissions.

Vektron® 6913 is currently certified under EPA's gasoline deposit control additive program and registered under EPA's fuel and fuel additives additive health effects program.¹ Infineum states that Vektron® 6913 acts to reduce NOx emissions when a vehicle is operated over time using commercially available gasoline containing the additive.

The following discussion outlines the background of EPA's evaluation of the potential impacts of Vektron® 6913 on emissions and summarizes the new data provided by Infineum. The purpose of this notice is to request comment to aid EPA in evaluating Infineum's fleet test and analysis regarding the impact of Vektron® 6913 on the emissions of the in-use vehicle fleet.

¹ See 40 CFR Part 80 regarding the requirements of EPA's gasoline deposit control additive and 40 CFR 79 for the health-effects requirements.

The comments we receive should provide useful information in determining the extent to which the use of Vektron® 6913 in gasoline provides an emissions benefit. This is important in evaluating the use of Vektron® 6913, under an emissions trading program or other state-sponsored market incentive initiative, in a state's SIP submission to the Agency.

History of EPA's Evaluation of Vektron® 6913

Infineum first approached EPA regarding the potential emissions benefits of its Vektron® 3000 series gasoline additive in 1996. At that time, EPA concluded that the available information was insufficient to quantify the overall emissions impacts of the gasoline additive.² Infineum's initial request to EPA was primarily based on data that Infineum used to support its emissions trading protocol for Vektron® 3364A (a similar package to Vektron® 6913) under Ontario's Pilot Emissions Reduction Trading (PERT) Project in 1997. Under the PERT project, the use of Vektron® 3364A in gasoline supplied from several gasoline terminals generates NOx emissions credits which are being resold and used by stationary emissions sources in Canada (such as power plants) to meet emissions control requirements. The PERT project is a demonstration project that caps the amount of emissions credits which can be generated under a given protocol.³ PERT reviews Infineum's emission credit protocol for the use of Vektron® 3364A at the conclusion of

² Letter from Charles N. Freed, Director, Fuels and Energy Division, U.S. EPA to Peter Chant, Consultant to Shell Chemical Company, August 12, 1996, II-C-01.

³ The documents associated with Infineum's application for Emission Reduction Credits (RTC) for the year 2000 PERT project period are contained docket item II-G-02. This includes the 2000 version of Infineum's emission credits protocol, and a summary of the emission credits generated in 2000 under the PERT program.

each ozone season.

To facilitate the evaluation of Infineum's emission credits protocol for Vektron® in the U.S., Infineum submitted its protocol to the State of New Hampshire's Department of Environmental Services (NHDES) requesting acceptance for use in the State. The NHDES arranged for a public hearing on the protocol. That public hearing was held in Concord, NH, on October 1, 1997.⁴ The emission credits protocol proposed by Infineum in the context of this hearing was based on essentially the same data that was used to support Infineum's application under the PERT project in 1997.⁵ Comments on the public hearing were received from various parties, including EPA.

At this time, EPA again concluded that the available data was insufficient to quantify the emissions impacts of Vektron® 3000 series. Based on comments from the public hearing, the state of New Hampshire issued a conditional approval for Infineum's protocol which granted a small, and according to Infineum, non-economically viable emissions reductions credit and which detailed the issues that would need to be addressed by Infineum before larger and more economically viable (to Infineum) emission credits could be generated from the use of Vektron®

⁴ Proposed Discrete Emissions Reductions (DER) submitted to the New Hampshire, Department of Environmental Services, Air Resources Division by Shell Chemical Company for its Vektron® Gasoline Additives, July 1997, docket item II-G-01, attachment c.

⁵The following documents associated with the public hearing in New Hampshire are contained in docket item II-G-01: Infineum's proposed emissions credits protocol, Comments on the public hearing, Shell's response to comments, and New Hampshire's conditional approval of Infineum's (then Shell Chemical's) "Protocol for the Reduction of NOx through the use of VEKTRON® 3000 additive.

3000 series additives in the State of New Hampshire.⁶

Following the public hearing in New Hampshire, in December of 1997, Infineum engaged EPA in discussions, seeking expert advice, regarding what additional testing and technical documentation Infineum might provide to facilitate our evaluation of the impacts of Vektron® 6913 on vehicle emissions.⁷ Acting in consideration of technical input from EPA and representatives of U.S. automobile manufacturers Infineum designed and executed the emissions test program that is the subject of today's notice.

II. Information on Infineum's Test Program

The test program that Infineum conducted to evaluate the emissions and fuel economy impact of Vektron® 6913 on a sample of vehicles, the test data from this program, and the statistical analysis of these data have been documented by Infineum. Infineum also provided information regarding issues that were not specifically addressed in its test program which have been included in the docket for this notice.⁸

⁶ Conditional approval by the state of New Hampshire of Shell's proposed "Protocol for the Reduction of NOx through the use of VEKTRON® 3000 additive, December 12, 1997, docket item II-G-01, attachment n.

⁷ Letter to Randall Evans, Infineum, and Peter Chant, Consultant to Infineum, from Deborah Wood, Acting Director, Fuels and Energy Division, February 10, 1999, docket item II-C-02.

⁸ Fleet Test Evaluation of Fuel Additive Performance on Emissions, Final Report from Southwest Research Institute (SwRI) to Infineum USA LP, July 2000, docket item I-B-01.

Test Data from Infineum's Test Program to Evaluate that Emission Impacts from Its Vektron® 6913 Additive, Infineum USA, LP, docket item I-B-02.

Infineum Emissions Reduction Gasoline Additive Technology, Infineum USA LP, docket item I-B-03.

Statistical Design and Analysis of Vektron® 6913 Emissions Fleet Trial, Infineum USA L.P, docket item

Infineum postulates that Vektron® 6913 acts by some method other than a reduction of combustion chamber deposits (CCD) levels (mass). This impact may be due in part to a change in the properties of CCD over time as a vehicle is operated on gasoline that contains Vektron® 6913.

III. Issues Which EPA Requests Comment On

Since the mechanism by which Vektron® 6913 may impact emissions is not well understood, there are issues regarding how to adequately account for potential interactions of variations in vehicle technology, fuel composition, and vehicle operating cycle in the design of a test program to evaluate the impacts of Vektron® 6913. These issues are summarized below. The majority of these issues were discussed in a letter from EPA to Infineum in February of 1999, during the October 1997 hearing in New Hampshire (referenced in Section II) and during several Infineum and EPA technical meetings beginning in April 1999. We are also requesting comments on Infineum's statistical design of their test program and the analysis of the data from this program. We request comments on the issues associated with Infineum's evaluation of the impacts of its Vektron® 6913 additive on the emissions performance of the vehicle fleet. The following sections broadly identify the basic subject areas included in EPA's evaluation of Infineum's request. EPA specifically invites comment on the issues identified below as well as any other related issues which commenters believe will inform EPA's decision making process.

Comments on the issues outlined below will be most useful if they include a detailed rationale and technical discussion. Comments on any other relevant issues not raised in this notice are welcomed.

1. Test Fleet

The test vehicles selected will impact the representativeness of the data in predicting the impacts of Vektron® 6913 on the emissions of the current and future in-use fleet. Infineum states that the test fleet was composed of a broad spectrum of in-use vehicles selected based on sales volume which they believe adequately represents the impact of Vektron® 6913 in the range of vehicle technologies present in the in-use vehicle fleet. We request comment on this issue. Specifically, we request comment on whether there are vehicles in the current or anticipated future fleet (e.g. tier 2 vehicles), not represented in Infineum’s test program that would respond in a substantially different manner to the use of Vektron® 6913.

2. Vehicle Acquisition and Randomness of Vehicle Assignment

In designing a test program it is important to acquire vehicles that would be representative of the current in-use fleet with regard to such factors as mileage accumulation, maintenance, and similar factors which could effect emissions performance. Additionally, in constructing a testing regime, random or other means of unbiased assignment is important to reduce the introduction of test result bias. The contractor that conducted the vehicle testing for Infineum (Southwest

Research Institute) either purchased or leased all of the 28 vehicles used in the test program on Infineum's behalf. The test program criteria for vehicle acquisition included a minimum odometer mileage accumulation of 15,000 miles and a maximum of 75,000 miles. Infineum states that vehicles were assigned to a fueling regime randomly.⁹ Infineum orally related to EPA that as test vehicles became available, they were assigned the next available number in the relevant vehicle group. For example, the first vehicle available in the GP vehicle group was designated as GP-1, the second vehicle that became available was designated as GP-2, and so on. Vehicles in a group were assigned to a fueling regime, fueled according to their vehicle number (i.e., 1,2,3,4 - see table 1 below). We request comment on the randomness of the vehicle selection and assignment to a fueling regime under Infineum's test program. We also request comment on the potential impact on program results due to the test vehicle fleet selected.

Table 1: Infineum Test Program Fueling Regime

⁹ Infineum Emissions Reduction Gasoline Additive Technology, Infineum USA LP, docket item I-B-03.

		Fueling Regime During Mileage Accumulation Phases		
Vehicle		Pre-Test Phase (1,000 miles)	Run 1 (8,000 miles)	Run 2 (8,000 miles)
Fuel	1	Reference Fuel	Reference Fuel	Test Fuel
	2	Reference Fuel	Test Fuel	Reference Fuel
	3	Reference Fuel	Reference Fuel	Alternating Fuels
	4	Reference Fuel	Alternating Fuels	Reference Fuel

3. Base Gasoline Composition

The base gasoline composition is an important consideration in projecting the emissions impacts of the fuel additive on NOx when added to the range of typically available in-use fuels. The base gasoline used in the Infineum test program according to Infineum approximates a non-oxygenated California reformulated gasoline (e.g. low deposit forming potential). Infineum states that they are in agreement with industry experts, that gasoline composition can affect emissions. Infineum states that the base gasoline used in their test program would yield a conservatively small estimate of the impact of Vektron® 6913 on emissions. We request comment on this issue. Specifically, we request comment on whether the impact of Vektron® 6913 on emissions comparable to its impact related to in-use fuels would be substantially different in gasolines that have an aromatics content or T-90 distillation point or other differences from the test fuel used in Infineum’s test program. In considering this issue, we request that commenters refer to the

technical literature provided in Infineum's support document.¹⁰

4. Representativeness of Reference Additive

The reference additive used in the test program determines the baseline against which the emissions impacts of Vektron® are evaluated. Thus, it is important that the reference additive be representative of current in-use deposit control additives as these might effect emissions performance. Infineum states that the test fuel (that contained Vektron® 6913) and the reference fuel (that contained the reference additive) contained the same type and amount of detergent-active ingredients.¹¹ The reference fuel contained the reference deposit control additive, referred to as Infineum F7721, at a concentration of 154 pounds per thousand barrels (PTB) of gasoline. The test fuel contained Vektron® 6913 at 234 PTB.¹² We request comment on whether the reference additive as used by Infineum in this test program is representative (in composition and concentration) to other deposit control additives on the market with respect to its efficacy in controlling intake valve deposits and its impact on combustion chamber deposits (CCD). We are

¹⁰ Section 7, Infineum Emissions Reduction Gasoline Additive Technology, Infineum USA LP., docket item I-B-03.

¹¹ Both the reference additive and Vektron® 6913 have been certified by EPA under our gasoline deposit control program as suitable for use in gasoline to satisfy the requirement under section 211(l) of the Clean Air Act that all gasoline in the U.S. must contain additives capable of limiting the formation of deposits in engines and fuel supply systems. EPA's deposit control additive program (40 CFR 80) requires that to be certified for use, an additive's ability to control fuel injector and intake valve deposits must be demonstrated using EPA-specified procedures.

¹² Infineum states that the reference additive is a conventional deposit control additive composed of pibamine detergent components, a synthetic carrier oil, and aromatic solvents. Infineum states that the Vektron® 6913 additive contains the same detergent components and aromatic solvents with the synthetic carrier oil substituted by the Vektron® 1200 polyoxyalkylate component.

also interested in the extent to which the emission performance of vehicles operated on fuel using Infineum's reference additive accurately estimates the emission performance anticipated if the vehicles were operated on fuel using other typical additives. We specifically request comment on whether the test results presented by Infineum are predictive of Vektron® 6913's impacts relative to the range of in-use additives on the market.

5. Mileage-Dependency of Vektron® 6913's Impacts

The issue of how quickly the emission impacts of Vektron® 6913 take effect is important to projecting its potential in-use emission benefits, because Infineum states that the impact of Vektron® 6913 on emissions and fuel economy manifests itself only after a vehicle is operated using Vektron® over time. Infineum intends to market its Vektron® 6913 as an additive for fuel used only during the ozone season (for example, spring to late summer). Thus, the amount of mileage that must be accumulated using Vektron® before it has its full impact on emissions is an important input in the calculation of the emissions benefits from the use of Vektron® over the period it is used. Infineum states that after a vehicle is operated for 1,000 miles using Vektron® 6913, the full effect of Vektron® 6913 on emissions is realized.¹³ Infineum's test program evaluated Vektron® 6913's impacts after the test vehicles were operated using Vektron® 6913 for 8,000 miles. Infineum did not provide any publicly available data in support of their conclusion

¹³ Section 6, Infineum Emissions Reduction Gasoline Additive Technology, Infineum USA LP., docket item I-B-03.

that the full impacts of Vektron® 6913 are realized after 1,000 miles.¹⁴ The issue of how quickly Vektron® 6913 acts to impact vehicle emissions is significant in determining a set quantity of NOx emissions reduced over a given amount of time during which Vektron® 6913 is used. We request comment on this issue.

6. Statistical Procedures Used to Identify Outliers

The procedure used to identify outliers is important, as the exclusion of data from the analysis can significantly affect the emission change attributed to use of Vektron® 6913. Infineum used a generalized linear model (SAS procedure PROC GLM) and Studentized-deleted residuals to the baseline and Run 1 data to identify two outliers: a Pontiac Grand Prix (GP1) and a Ford F-150 (FF4). Vehicle FF4 was identified early before vehicle GP1 was run and gave a Studentized-deleted residual greater than 4.0 and was dropped from the analysis. When vehicle GP1 became available and was tested in the statistical model, its Studentized-deleted residual was 3.78 and consequently Infineum dropped this vehicle from the final analysis.

A different statistical model was used to identify outliers (PROC GLM) than to determine emission effects (PROC MIXED). One outlier (FF4) was deleted from the database using a portion of the database and then further tests for outliers (e.g., GP1) were performed without the original outlier in the database. The presence of outliers was assessed only on the baseline and

¹⁴ See section 7, Infineum Emissions Reduction Gasoline Additive Technology, Infineum USA LP., docket item I-B-03.

Run 1 data (i.e., excluding Run 2 data). In contrast, the test for carryover discussed below in Issue 8 involved data from both Runs 1 and 2, but excluded outliers identified using only Run 1 data.

We request comment on Infineum's approach to removing outliers, particularly the following: 1) use of a different statistical model to identify outliers (PROC GLM) than to determine emission effects (PROC MIXED); 2) deleting outliers one at a time; 3) identifying outliers after performing the assessment of carryover and comparing the emission impact of continuous and alternating use of Vektron® 6913; and 4) inclusion of a vehicle type term in the PROC GLM model.

7. Exclusion of Statistical Outliers

Determining that a specific data point or set of data is an outlier from a statistical point of view may or may not be sufficient evidence to appropriately exclude that data from an analysis. The vehicles in the Vektron® test program were screened and pretested for proper operation, oil consumption and emissions. Replicate tests were performed at all testing points and a third test performed when the first two exceeded specified criteria according to the CAC Auto/Oil Protocol. Mechanical evaluation of FF4 at the end of the test program discovered problems with the EGR valve which was shown to affect NOx emissions significantly. At the end of the test program, no mechanical problems with GP1 were found. In general, based upon this analysis of the mechanical condition of the vehicles, should vehicles FF4 and GP1 be excluded from subsequent analysis? Should a statistical outlier be excluded if no mechanical problems could be found with the vehicle

and the emission measurements were replicated? Should the HC and CO emissions of these vehicles be considered, as well as their emissions over the US06 and HFET test cycles, in determining whether or not to exclude them from the analysis?

8. Carryover Effect in the Analysis

In the context of this test program, a “carryover” effect exists when the effect of one fuel additive persists during a subsequent test of a different additive, for example, treatment fuel during Run 1 affects the test of reference fuel during Run 2. Infineum believed that 8,000 miles of operation on a specific fuel additive would be sufficient to eliminate such carryover, but subsequently concluded that the Run 2 data from vehicles fueled with the reference fuel still exhibited the affect of Vektron® 6913. Therefore, Infineum chose to eliminate all Run 2 data from subsequent analysis. The model used to test for carryover effects specified $\ln(\text{FTP NO}_x)$ as the response variable, accumulated-miles and treatment-order as fixed effects and vehicle type as a random effect.

EPA requests comment on these points: (1) Is this model formulation appropriate to determine that carryover was present? Specifically, should the model have included a variable indicating the use of the Vektron® additive, either continuously or in an alternating fashion? Also, should the test for carryover be focused exclusively on those vehicles in Run 2 which were operated on the Vektron® additive in Run 1? Would there be any reason to expect carryover effects for those vehicles operated on the reference fuel in Run 1 and Vektron® 6913 in Run 2? (2) Infineum states that the literature teaches that with a two-stage crossover design no estimate of direction of large carryover is possible.

Is it possible to determine the magnitude and direction of carryover in this type of study? Is this test program appropriately determined a 2 stage crossover design, as described in the drug testing (or other) literature, since the vehicles were not returned to their baseline conditions between Runs 1 and 2? (3) How does the use of fuel additives in test vehicles prior to recruitment into the test program affect interpretation of the test results, particularly the assessment of possible carryover? (4) Is it consistent to expect Vektron® 6913 to reach its full emission effect in 1,000 miles and to continue to affect emissions 8,000 miles after discontinuation of its use?

9. Carryover Effect and the Exclusion of All Run 2 Data

Infineum excluded all Run 2 data from its final analysis, citing standard practice following detection of a large carryover effect. This reduces by approximately 50% the number of measures of the effect of the Vektron® additive. As described above, Infineum concluded that a large carryover was observed and the reference was not repeated in Run 2. Therefore, Infineum believed that it was not appropriate to extrapolate Run 1 reference fuel data to compare to Run 2 test fuel data (as well as the reverse). Therefore, Infineum felt that no estimation of the treatment effect could be made when Run 2 data were included. Is it possible to include a term for carryover in the statistical model and continue to use all of the data to estimate the impact of Vektron® 6913 on emissions? Is Infineum's decision to exclude all of the Run 2 data appropriate in the context of fuel additive testing, where we are not comparing the effect of two new factors (e.g. drugs), but the substitution of one fuel additive for others which are widely used? Specifically, is it appropriate to retain the Run 2 data for the subset of vehicles for which the test additive was used only in Run 2 (Vehicles numbered 1 and

3)? We also request comment on whether the testing of the reference additive for 8000 miles in Run 1 followed by the testing of the Vektron® 6913 additive for 8000 miles simulates the situation which would occur in-use should the Vektron® additive replace current additives?

10. Appropriateness of the Analysis on the Individual Test Results and the Averages

Two options exist for analyzing the Infineum data. One statistically analyzes the data from all individual emission tests and the other analyzes the emission levels averaged across replicates at each test phase. Each vehicle at each test point was tested at least in duplicate over the FTP, HFET, and the US06 driving cycles. The need for a third emission test was based on test repeatability criteria established in the CAC Auto/Oil Protocol: if the higher emission value divided by the lower emission value was greater than 1.33 for HC, 1.70 for CO, or 1.29 for NO_x, a third test was run. Infineum believes that this procedure stabilizes the mean emission level sufficiently. However, in some cases where only two tests were performed, the two measurements differed by only a percent or two, while in others, the difference was nearly 30%. EPA requests comment on whether the statistical analysis would be appropriately performed on individual trial results, as well as on the average emission levels for each phase and which would be more illustrative of the effects of Vectron 6913.

11. Emissions Effects of the Vektron® Additive Using the FTP Emissions and the US06 and HFET Emissions

Emission data are available over three driving cycles: the standard EPA urban driving cycle

(the FTP), the US06 high-speed, high-load cycle, and the Highway Fuel Economy Test (HFET). Infineum estimated the 10% NO_x emission benefit of its Vektron® 6913 additive using only emissions measured over the FTP. Should the emission results from these other two cycles be included in estimating the in-use emission impacts of Vektron® 6913 or in responding to the other issues raised in this notice?

12. Combining Data Reflecting Continuous and Alternating Use of Vektron®

The Vektron® additive was used continuously in half of the test vehicles and in every other tankful in the other half of the vehicles. Infineum selected these two fueling protocols to represent the two basic modes of potential use of the Vektron® additive by individual vehicles in the fleet. Infineum reported no statistical difference in NO_x emissions between the continuous and alternating (by tankful) use of Vektron® 6913. Infineum based this conclusion on two types of analyses. First, Infineum used a simple model including only a term for vehicle type, and no treatment term. Based on a plot of residuals grouped by treatment (continuous versus every other tankful), Infineum concluded that the effects of continuous and alternating fuel treatments did not differ significantly. Second, Infineum compared the fit of two models, one including only a term for treatment, and another adding a term for fueling-scheme (continuous versus alternating). Based on a conclusion that including the fueling-scheme term did not improve model fit, in combination with the results of the first analysis, Infineum pooled the continuous and alternating fuel treatment into a single treatment term (additive present) to assess the effect of additive treatment. Are the statistical analyses employed appropriate to support a conclusion that the two fueling schemes did not differ in result? Is the

collapsing of data from the two fueling schemes into a single data set an appropriate step if no significant difference between them is found?

13. Appropriateness of a Single Point Estimate to be Developed from the FTP Emission Results or a Weight of Evidence Approach

As indicated by the issues described above, it is possible to develop differing estimates of the impact of Vektron® 6913 on NOx emissions, depending on whether Run 2 data is included or excluded, certain apparent outliers in Run 1 are included or excluded, whether the effect of Vektron® 6913 used continuously or alternatingly is assumed to have the same effect or not, whether NOx emission impacts over the US06 and HFET cycles are considered, etc. Should we attempt to come up with the single best approach to analyzing the SwRI test data and develop a single point estimate, or where reasonable alternatives appear to exist, should we develop multiple estimates and then estimate an emission benefit for use in determining in-use emission credit trading purposes? If we should develop multiple estimates, how should an appropriate single in-use emission benefit be estimated from the range of NOx emission benefits resulting from the variety of possible statistical procedures? Should EPA be more concerned about ensuring that any projected NOx emission benefits associated with Vektron® 6913 are highly likely to occur in-use (i.e., avoid the potential for over-estimating the benefit)? Or, should we be more concerned with encouraging innovative approaches to emission control (i.e., avoid under-estimating the benefit)?

14. Calculating the Impact on HC and CO Emissions

Infineum found that its Vektron® additive affect on NOx emissions was statistically significant, but that its effects on HC and CO emissions were not statistically significant (i.e., the 90% confidence interval included zero change in emissions). While the average change in HC and CO emissions found were smaller than the change in NOx emissions, the average effects were not zero. If we determine the effect of Vektron® 6913 on NOx emissions, should we determine that Vektron® 6913 increases HC and CO emissions by the average amount found by the test program, or should we assume that the HC and CO effects are zero because the emission increases were not statistically significant?

IV. Conclusion

EPA will carefully consider all comments received. We will evaluate these comments and

other information or analyses which may become available, including perhaps conducting additional analyses of our own in arriving at our conclusion as to the emission benefits of Vektron® 6913 as proposed for fuel additive use by Infineum. This conclusion will be publically available via our web site. If that conclusion indicates significant emission benefits could be derived from the use of this fuel additive, we will also prepare appropriate protocols for determining the extent of actual in-use on-highway fleet emissions benefits.

Dated: _____

Robert Brenner, Acting Assistant Administrator

Office of Air and Radiation